A COMPREHENSIVE AND ELABORATE DISCUSSION ON ORGIN OF GRAVITY

Interested persons may see my previous paper on Gravity, which I want to discuss in a more detailed way here. Basically, according to my concept a Primordial Energy Field in absolutely un-perturbed condition and with entropy zero was acted upon by an operator (Hamiltonian) causing the energy field to split into two domains------ one representing the observable world with tangible things and the other domain containing intangible things like Time-Space, Dark Matter and Dark Energy etc. The bridge between these two domains is Gravity in the form of a tensor $G_{\square\square}$.

We are considering the first domain consisting of tangible things (Gross Matter) as Ket Vector $|\psi 2\rangle$ and the second zone consisting of intangible things (Subtle matter) as represented by Bra Vector $\langle\psi 1|$.

The metric tensor $G_{\square\square}$ can be seen as an operator that acts on both the Bra and Ket vectors of the wave function ψ, modifying them according to the gravitational field described by the metric tensor. This action of Operator $G_{\square\square}$ on both the domains is denoted as follows

$$\langle\psi 1|G_{\square\square}|\psi 2\rangle$$

The Domain Psi1 (Gross Matter) creates the curvature of Space-Time (Psi2) and Psi 2 directs the motion of Psi1.

We are now making an important assumption that Domain 1(consisting of gross matters) contains matters with real value and Domain2 (consisting of Subtle matters) dominated by

For instance, a complex matrix might look like this:

$$\begin{bmatrix} 2+3i & 4-5i \\ -1+2i & 3+0i \end{bmatrix}$$

Here, i represents the imaginary unit, where $i^2 = -1$. Tensors, which generalize matrices to higher dimensions, can also be filled with complex numbers, making them highly versatile in fields like quantum mechanics, signal processing, and machine learning.

imaginary values which start with a prefix i (i^2= -1). The operator G □□ is a metric tensor which contains elements of complex numbers.

The general form of a complex gravity tensor might look something like this:

Gμν=Rμν−(1/2)Rgμν+Λgμν or G_{\mu\nu} = R_{\mu\nu} - \frac{1}{2} R g_{\mu\nu} + \Lambda g_{\mu\nu}

where Gμν or G_{\mu\nu}, the Einstein tensor, would now include complex elements. To incorporate the imaginary domain, I might propose:

$$ G_{\mu\nu} = G^{(r)}*{|mu|nu} + i G^{(i)}*{\mu\nu} $$

Here:

- Gμν(r) or G^{(r)}_{\mu\nu}: The real part of the tensor, representing gravity's action in the gross (real) domain.
- Gμν(i) or G^{(i)}_{\mu\nu}: The imaginary part of the tensor, representing its action in the subtle (imaginary) domain.

The components Rμν or R_{\mu\nu} (Ricci curvature tensor) and gμν or g_{\mu\nu} (metric tensor) would also have corresponding real and imaginary counterparts to reflect interactions within and between the domains.

This complex formulation could allow for dynamic interactions between the real and imaginary domains, facilitated through the gravitational "bridge." The presence of complex numbers could open intriguing possibilities for how energy or information flows between the two parts of the original primordial field.

1. Dual Nature of Reality

- The separation of gross matter and subtle matter, bridged by gravity, could introduce a dual-framework approach to understanding the universe.
- Subtle matter could govern phenomena that appear non-local or non-mechanical, such as quantum entanglement or the fabric of spacetime itself.
- The interaction between these domains via a complex gravity tensor might yield testable effects, like subtle corrections to gravitational behavior or spacetime geometry.

2. Extensions to General Relativity

- General Relativity, which uses a real-valued metric tensor to describe spacetime, could be extended to a *complex-valued metric tensor*.
- The imaginary components might represent interactions with the subtle matter domain, influencing phenomena like frame dragging, spacetime curvature, or singularities.

3. Implications for Quantum Mechanics

- Quantum mechanics often involves complex numbers inherently. A connection to a primordial field with an imaginary domain might offer deeper insight into the probabilistic nature of quantum mechanics.
- Gravity's role as a bridge could provide a starting point for unifying General Relativity and Quantum Mechanics—a longstanding challenge in physics.

4. Energy Transfer Across Domains

- The action of gravity as a complex tensor could describe how energy or information transitions between gross and subtle matter.

- This might manifest as small deviations in energy conservation in closed systems or as corrections to the thermodynamics of black holes.

5. Observable Predictions

- **Gravitational Waves:** Could exhibit frequency shifts or phase modulations reflective of subtle matter interactions.

- **Cosmology:** The imaginary domain might influence the evolution of the early universe, potentially leaving imprints in the Cosmic Microwave Background (CMB).

- **Dark Matter & Dark Energy:** These elusive components might find a natural place in the framework if they reside predominantly in the subtle, imaginary domain.

Exploring the physical implications would involve identifying experiments or observations that could potentially validate this theory. For instance, phenomena like gravitational lensing, frame dragging, or deviations from Newtonian gravity could offer avenues for testing.

The idea of relating gravity with mass, particularly with the Higgs boson (commonly nicknamed the "God particle"), is an intriguing line of study.. Let's delve into how this connection might manifest, based on my

hypothesis of a primordial energy field and the role of gravity as a complex tensor bridging domains

1. Mass and the Higgs Mechanism

- The Higgs field is responsible for giving particles mass through the Higgs mechanism. When certain particles interact with the Higgs field, they acquire mass, with the Higgs boson being the observable quantum of this field.
- In my framework, the gross matter domain could naturally include mass as a property arising from Higgs field interactions. The subtle matter domain, on the other hand, might influence the Higgs field's behavior or its coupling to particles through gravitational interactions.

2. Gravity and Mass

- In General Relativity, gravity arises due to the curvature of spacetime created by mass and energy. Mass tells spacetime how to curve, and curved spacetime tells objects how to move.

- If gravity, as my hypothesis suggests, has a complex tensor form that includes both real and imaginary components, it might imply that gravity's interaction with mass is more nuanced. For instance, the imaginary domain might affect how the Higgs field operates, potentially introducing subtle corrections to the way particles acquire mass

3. Unifying Gravity and the Higgs Field

- A unification could emerge by extending the standard model of particle physics to incorporate a complex gravitational tensor. This tensor might couple directly to the Higgs field, influencing its dynamics in both gross and subtle domains.

- This relationship might provide insights into why gravity is so weak compared to other fundamental forces (the "hierarchy problem") or offer a pathway for incorporating gravity into a quantum framework.

4. Physical Implications

- The complex interaction between gravity and the Higgs field might manifest as tiny, measurable deviations in the expected properties of the Higgs boson or gravitational phenomena.

- It could also lead to modifications in the early universe's dynamics, where the interplay between gravity and the Higgs field might influence cosmic inflation or the formation of mass structures.

I think this connection opens up profound possibilities for addressing some of the biggest unsolved questions in physics, such as the nature of dark matter, dark energy, or even the origins of mass itself.